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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/066,463	01/31/2002	Hideaki Kurihara	FUJO 19.398	2188

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EXAMINER

LERNER, MARTIN

ART UNIT	PAPER NUMBER
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2654

DATE MAILED: 02/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/066,463

Applicant(s)

KURIHARA ET AL.

Examiner

Martin Lerner

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 January 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2 to 4, 6 to 8, 10 to 12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2 to 4, 6 to 8, 10 to 12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on 23 August 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 2, 4, 6, 8, 10, and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by *Oshikiri et al.*

Regarding independent claims 2, 6, and 10, *Oshikiri et al.* discloses a variable rate encoder, comprising:

“an LSP coefficient calculating unit calculating an LSP coefficient obtained from the voice signal” – the input signal is supplied to an LPC coefficient analyzer 23, which obtains LSP coefficients by the correlation method; LPC coefficients are supplied to an LPC coefficient transformer 24 to be converted to LSP coefficients (column 10, lines 25 to 31: Figure 2);

“an LSP interval judging unit judging whether an interval between the LSP coefficients is equal to or less than a prescribed threshold” – spectral fluctuation amount calculator 36 uses the input calculated LSP coefficients to obtain a fluctuation amount between LSP coefficients; the fluctuation amount is defined as the Euclidean distance

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between the LSP coefficients according to Equation (4); the Euclidean distance is compared to a predetermined threshold T_f ; if the Euclidean distance is less than predetermined threshold T_f , then it is decided that the speech signal is background noise and not speech (column 11, line 20 to column 12, line 18: Figure 3);

“a judging unit judging whether a voice signal is a vowel when a voice part of a voice signal is sounded” – voiced appearance probability calculation section 106 calculates whether the acoustic parameters at acoustic parameter calculation section 102, as derived from the input signal at input terminal 101, represent voiced speech signals; voiced/unvoiced decision section 109 decides whether the input signal is voiced or unvoiced (column 17, line 63 to column 18, line 57: Figure 14); a voiced speech signal corresponds to a vowel sound, and an unvoiced speech signal corresponds to a consonant (column 1, line 66 to column 2, line 6);

“a rate setting unit setting a voice encoding bit rate, if the voice signal is a vowel said voice encoding bit rate is set to a bit rate lower than the bit rate usually used when the voice part is sounded” – selector 304 obtains the result from the voiced/unvoiced classification apparatus 303; if it is decided that the input signal is voiced, the signal is supplied to a voiced encoder 309; if it is decided that the signal is unvoiced, the signal is supplied to an unvoiced encoder 308 (column 19, lines 29 to 62: Figure 16); a speech signal can be divided into a voiced period having high periodicity and corresponding to a vowel and an unvoiced period having low periodicity and corresponding to a consonant (column 1, line 66 to column 2, line 2); thus, a non-silent speech signal (“voice part”) is a vowel for any voiced period; also, any frame having a pitch period, i.e. a voiced period

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or frame corresponding to a vowel, can be expressed with a smaller amount of information than would otherwise be the case (column 5, line 16 to column 6, line 36); it follows that any voiced period corresponds to a vowel and is encoded at a lower bit rate.

Regarding claims 4, 8, and 12, *Oshikiri et al.* further discloses:

“storing a plurality of templates for registering LSP coefficients of a vowel and judging whether the LSP coefficients obtained from the voice signal is approximately equal to the LSP coefficient registered in the template” – voiced appearance probability calculation section 106 has M voiced appearance probability tables 107 and 108 (“templates”) corresponding to the number of types of acoustic parameters as keys (column 18, lines 24 to 30: Figure 14); clearly, these probability tables are stored; the acoustic parameters calculated by acoustic parameter calculation section 102 are speech feature amounts (column 17, line 63 to column 18, line 6), and speech feature amounts include LSP coefficients from feature amount calculation section 12 (column 10, lines 7 to 12: Figure 1); thus, the acoustic parameters of the probability tables are compared to the speech signal as LSP coefficients;

“wherein if it is judged that the LSP coefficient obtained from the voice signal is approximately equal to the LSP coefficient of the template, an encoding bit rate of the voice signal is lowered” – the result obtained by the voiced/unvoiced classification apparatus 303 is supplied to selector 304, and if it is decided that the input signal is voiced, the signal is applied to a voiced encoder 309 (column 19, lines 50 to 55: Figure 16); a voiced speech signal corresponds to a vowel sound, and an unvoiced speech

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signal corresponds to a consonant (column 1, line 66 to column 2, line 6); thus, the overall bit rate is reduced by voiced/unvoiced classification.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3, 7, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Oshikiri et al.* in view of *Taguchi*.

Oshikiri et al. further discloses hangover processing changes the decision result based upon whether the speech exists for a predetermined number of frames.

Hangover time calculation section 55 calculates hangover time HO based upon HO_{LSP} , which is the magnitude of the peak of a spectral envelope represented by the estimated LSP coefficients. (Column 16, Line 8 to Column 17, Line 35: Figures 11 and 12)

Oshikiri et al. applies hangover time processing to determine whether to regard the signal component as background noise or speech, but omits applying this processing to judge whether the signal component is a voiced portion, i.e. a vowel.

However, *Taguchi* teaches a speech coder which matches patterns of LSP coefficients to classify a predetermined section of speech at transitional parts of a vowel or consonant so that information compression can be attained through variable frame lengths. (Column 1, Lines 9 to 39) A frequency interval sensitivity W_w ("an interval

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between the LSP coefficients") is one of the parameters that must be subjected to pattern matching. (Column 12, Lines 27 to 55: Figure 4A) Frequency interval sensitivity W_w is determined on a frequency interval of the first and second LSP parameters. The frequency interval must be below a predetermined value ("within a prescribed range") for the length of a frame ("for a specific time period") so as to find out whether the section is inclined or flat. Non-inclined (flat) sections are coded with variable frame lengths. (Column 4, Lines 29 to 47; Column 14, Lines 55 to 58) *Taguchi* suggests that a more accurate spectral distance measure to identify transition portions is obtained by using the frequency interval sensitivity. (Column 3, Lines 21 to 30)

It would have been obvious to one of ordinary skill in the art to utilize the method of *Taguchi* for determining whether LSP coefficients are below a predetermined value for the length of a frame in order to identify whether the speech segment is a vowel in the variable rate speech coder of *Oshikiri et al.* so that the spectral distance is more accurately measured.

Response to Arguments

5. Applicants' arguments filed 07 January 2003 have been fully considered but they are not persuasive.

Firstly, regarding the rejection under 35 U.S.C. § 102(e), Applicants argue that *Oshikiri et al.* only describes a Euclidian distance between LSP coefficients for noise/speech classification. In contrast, Applicants say their invention differs in the manner in which the LSP coefficient is used. Also, regarding the rejection under 35

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U.S.C. § 103(a), Applicants say *Taguchi* implies expression (2) does not work and is not satisfactory, and that the teachings of *Taguchi* are thus contradictory to the invention.

This position is traversed.

Regarding the rejection under 35 U.S.C. § 102(e), the claims do not say anything about any particular method of judging the interval between LSP coefficients. *Oshikiri et al.* describes comparing a Euclidian distance between LSP coefficients to a predetermined threshold T_f for noise/speech classification. This is what is required to meet the terms of the independent claims. The fact that any particular distance measure is used instead is not relevant to a rejection under 35 U.S.C. § 102(e). The features upon which Applicants rely are not recited in the rejected claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Regarding the rejection under 35 U.S.C. § 103(a), it is respectfully maintained that *Taguchi* does not teach away or provide any disclosure that is inconsistent with *Oshikiri et al.* Those having ordinary skill in the art would know that there are many ways of measuring the distance or difference between speech features. A Euclidian distance is one of these. The comments regarding expression (2) in *Taguchi* are directed to the utility of weighting coefficient W_k and not the Euclidian distance *per se*. Thus, the implications drawn by Applicants with respect to expression (2) from *Taguchi* are unwarranted.

Secondly, Applicants argue that *Oshikiri et al.* fails to meet the limitation of a judging unit judging whether the voice signal is a vowel when a voice part of the voice signal is sounded. By contrast, Applicants say *Oshikiri et al.* only describes a voiced/unvoiced vowel section decides that the input signal is voiced or unvoiced. This position is traversed.

It is agreed that *Oshikiri et al.* presumes every voiced period of a speech signal is vowel, but *Oshikiri et al.* still meets the literal terms of the independent claims. *Oshikiri et al.* discloses a speech signal can be divided into a voiced period having high periodicity and corresponding to a vowel and an unvoiced period having low periodicity and corresponding to a consonant. (Column 1, Line 66 to Column 2, Line 2) Thus, *Oshikiri et al.* assumes that every non-silent speech signal that is voiced is also a vowel. Furthermore, *Oshikiri et al.* discloses any frame having a pitch period, i.e. a voiced period or frame corresponding to a vowel, can be expressed with a smaller amount of information than would otherwise be the case. (Column 5, Line 16 to Column 6, Line 36) It follows that any voiced period corresponds to a vowel and is encoded at a lower bit rate.

The claims do not draw any distinction between a voiced period that is a vowel and a voiced period that is not a vowel, e.g. a consonant transition region. The claims only refer to a 'voice signal' and a 'voice part'. The term 'voice signal' is understood to be equivalent to a 'speech signal'. However, the term 'voice part' has no standard, recognized definition in the art, and is open to interpretation. Specifically, the claims do not set forth any distinction between voiced and unvoiced speech so as to show 'voice

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part' is equivalent only to 'voiced speech'. It would be reasonable to conclude that 'voice part' refers to 'non-silent portions' of the speech signal, implicitly inclusive of both voiced and unvoiced speech, as the claims set forth no express voiced/unvoiced distinction. Although the voiced part is always a vowel in *Oshikiri et al.*, the claims do not say the 'voice part' is ever other than a vowel.

Oshikiri et al. discloses that the speech signal ('voice signal') is first determined to be either speech ('voice part') or silence (non-'voice part'), and then determined to be voiced or unvoiced. A voiced speech signal corresponds to a vowel, and periodic vowel sounds are encoded with a lower bit rate as expressly disclosed by *Oshikiri et al.* It would be reasonable to conclude Applicants' 'voice part' corresponds to a non-silent portion of the speech signal, and a vowel corresponds to a voiced portion (as opposed to an unvoiced portion). Thus, *Oshikiri et al.* discloses the invention as claimed.

During patent examination, the pending claims must be "given the broadest reasonable interpretation consistent with the specification." Applicant always has the opportunity to amend the claims during prosecution, and broad interpretation by the examiner reduces the possibility that the claim, once issued, will be interpreted more broadly than is justified. *In re Prater*, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-51 (CCPA 1969)

Therefore, the rejections of claims 2, 4, 6, 8, 10, and 12 under 35 U.S.C. § 102(e) as being anticipated by *Oshikiri et al.*, and of claims 3, 7, and 11 under 35 U.S.C. § 103(a) as being unpatentable over *Oshikiri et al.* in view of *Taguchi*, are proper.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to Applicants' disclosure.

Gersho et al. and Van de Laar et al. disclose that vowels may be encoded with lower bit rates than consonants.

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin Lerner whose telephone number is (703) 308-9064. The examiner can normally be reached on 8:30 AM to 6:00 PM Monday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold can be reached on (703) 305-4379. The fax phone numbers for the organization where this application or proceeding is assigned are (703)

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872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.



Marsha D. Banks-Harold
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February 20, 2003